

68000: The Powerhouse Behind The Macintosh, Atari ST, & Amiga

COMPUTE!

\$2.95
February
1986
Issue 69
Vol. 8, No. 2
\$3.75 Canada
02193
ISSN 0194-357X

The Leading Magazine Of Home, Educational, And Recreational Computing

Apple SpeedCalc

A Powerful Spreadsheet
Programs Inside For II+, IIe, IIc

High Rise
Exceptional Arcade Game
For Commodore 64, 128,
Atari, And Apple

**Commodore
Speedy Strings**
A New Technique
For Fast-Loading Data

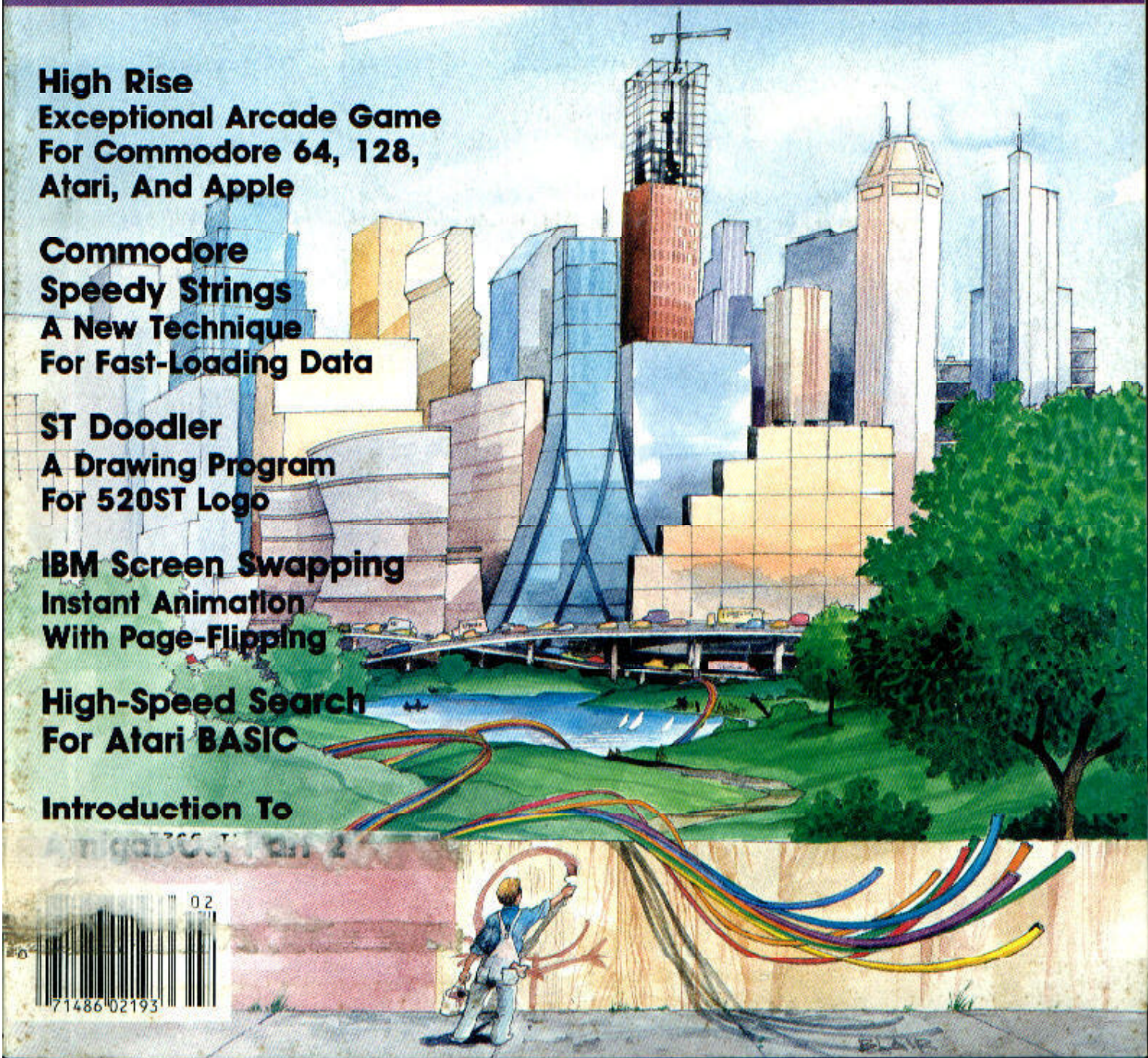
ST Doodler
A Drawing Program
For 520ST Logo

IBM Screen Swapping
Instant Animation
With Page-Flipping

High-Speed Search
For Atari BASIC

Introduction To

AmigaBASIC Part 2



loads the two utilities you mentioned. Be sure to save the program before you run it, since it performs NEW after installing "TurboDisk" and the DOS Wedge:

```
10 REM THIS PROGRAM ERASES  
ITSELF--SAVE BEFORE YOU RUN  
20 IF Z=2 THEN 60  
30 IF Z=1 THEN 50  
40 Z=1:LOAD"DOS 5.1",8,1  
50 Z=2:LOAD"TURBODISK.OBJ",8,1  
60 SYS 49152:SYS 52224:NEW
```

Along with many other new features, the Commodore 128 has the ability to perform a true autoboot. When you turn it on, the 128 searches track 1, sector 0 of the disk in the drive for a special "signature" code consisting of the characters CBM. If that code is present, the system loads and runs the program specified in the autoboot sector. Since the autoboot program can in turn load and run a larger boot program, it's possible to create quite an elaborate boot sequence, which loads and activates your favorite utilities and otherwise configures the system exactly to your liking. Autobooting works with the 1541 disk drive (even for CP/M disks) as well as the newer 1571. COMPUTE!'s Commodore 128 Programmer's Guide contains a detailed discussion of the autoboot process as well as a program that creates autobooting disks for the 128.

More TI Supplies

Sorry that we weren't able to be included in your September 1985 list in this column of Texas Instruments suppliers. We're a small business and work directly with various distributors across the country. Rather than stock items, we place orders with our distributors according to our customers' needs. We offer a delivery time of two weeks in most cases.

Mary Ann Holzer
Creative Ideas
7062 South Tamarac Street
Englewood, CO 80112

Please include us on your list of companies that support the TI-99/4A computer. We have been in business since 1982 and provide software, hardware, and peripherals for the TI-99/4A as well as other computers.

Bob Polizzotto
Multi Video Services
P.O. Box 746
East Amherst, NY 14051

Thank you for the information.

Custom Cursors For 64 SpeedScript

Even though I have used more elaborate word processors with my Commodore 64, I frequently prefer to use SpeedScript because of its speed and convenience. However, I find the incessantly

blinking cursor a distraction. Can you tell me how to get rid of it?

Paul Newsom

Just as everyone seems to prefer different screen colors, some people like a blinking cursor while others find it maddening. Fortunately, it's easy to stop the blink or change its speed. Of course, you wouldn't want to eliminate the cursor altogether, since that would make it hard to find your way around inside a document. To defeat the blink, load SpeedScript into memory, type one of the following lines in direct mode (without a line number), and press RETURN. Be sure to use the correct POKEs for the version of SpeedScript you're using, and type very carefully—even a small error may have drastic consequences:

SpeedScript 2.0
POKE 2527,240:POKE 2528,246

SpeedScript 3.0 or 3.1 (Commodore 64 only)
POKE 2698,240:POKE 2699,246

Resave SpeedScript under a new filename to distinguish this version from the original. Now the reverse video cursor remains steady rather than blinking. Since SpeedScript blinks the cursor only during idle times (when you're not pressing any keys), this has no effect on the rest of the program. To restore the blink, enter one of these lines:

SpeedScript 2.0
POKE 2527,165:POKE 2528,162

SpeedScript 3.0 or 3.1
POKE 2698,165:POKE 2699,162

Changing the cursor's blink speed is even easier. To make the cursor blink at half its normal rate, enter POKE 2530,32 (SpeedScript 2.0) or POKE 2701,32 (SpeedScript 3.0 or 3.1). To make the cursor blink in double-time, POKE the same location with 8 instead of 32. Depending on your preferences, you may find one of these preferable to the default speed. POKE the same location with 16 to restore the normal blink rate. Because the blink is created by replacing the character under the cursor with its reverse video equivalent, there's no way to change the cursor's actual appearance without grafting a complete set of custom characters onto SpeedScript as well. (See "Commodore 64 SpeedScript Fontmaker," COMPUTE!, January 1986.)

Improving Atari CLOADs

I would like to respond to James Jenkins' letter in the October 1984 issue of COMPUTE! about Atari CLOAD errors 138 and 143. Here are a few suggestions:

When purchasing blank cassettes, buy only those whose cases are held together with five screws. Tape errors

are caused not so much by the quality of the tape as by the quality of the case. The Atari Program Recorders seem very susceptible to minor tape fluctuations caused by the tape binding in the case. Second, after using a tape for some time, it may become unevenly wound, causing it to bind and generate errors. To free the tape, slap it on the flat side of the cassette against a hard surface. This forces the tape against one side of the case and reduces errors. Finally, instead of pressing SYSTEM RESET to clear the screen, type GR.0 or press SHIFT-CLEAR. SYSTEM RESET can disrupt operation of the POKEY chip, which controls input/output operations. Thus, pressing SYSTEM RESET before you do a CSAVE or CLOAD can cause tape errors. To recover from this situation, type LPRINT and press RETURN while your printer (if you have one) is offline or switched off. You'll see an ERROR 138, but this simply means the printer is not responding. This resets the POKEY chip and allows error-free tape operations.

Richard L. Baldwin

Thanks for the advice. In a related letter, reader W. Byrom Dorsey points out that you can get similar information free of charge from Atari, 1265 Borregas Avenue, Sunnyvale, CA 94086. Just ask for the bulletin entitled "410 Tech Tips."

Atari Keyboard Buzzer

When I type 107 characters on my Atari 800XL, the computer sounds a buzzer. Is this a Revision B operating system bug, or does Atari have a purpose for it?

John Lapetina

The buzzer effect is a deliberate design feature, not a bug. It happens in BASIC with all Atari 400/800, XL, and XE computers with all versions of the operating system. (Incidentally, your 800XL has the XL operating system, not Revision B. Revision B fixed some bugs in the original Revision A operating system shipped with early 400s and 800s. It is available for XL and XE computers on the Atari Translator disk.)

The buzzer is analogous to the end-of-line bell on a typewriter: It warns when you are reaching the end of a BASIC logical line. A logical line is the maximum number of characters that can be typed after a line number. On the Atari, a logical line may be as long as three physical lines (screen lines). If a BASIC statement (or series of statements separated by colons) won't fit on a logical line, you must either shorten it or break it up into two logical lines.

The actual number of characters allowed in a logical line varies according to how the screen margins are set. Atari BASIC normally defaults to a 38-column



The Beginners Page

Tom R. Halthill, Editor

The Hidden Numbers Behind Strings

We dropped a tidbit in last month's column that we promised to explain later—that the alphabetic characters on a monitor screen are merely an outward illusion displayed by computers for our convenience. Internally, computers deal with numbers and *only* with numbers. This has some important implications when you work with character strings in BASIC.

Consider a short routine that asks a user to answer either "yes" or "no" to a question, and which then branches to another part of the program depending on the response. Here's how it might look:

```
10 DIM A$(1):REM This line for Atari
   only
20 PRINT "DO YOU WISH TO
   CONTINUE (Y/N)";
30 INPUT A$
40 IF A$="Y" THEN GOTO 60
50 IF A$="N" THEN END
60 PRINT "Program continues here..."
```

There are a couple of problems with this routine that aren't immediately apparent. At first glance, it seems solid enough: Line 20 asks the question; line 30 fetches and stores the keypress in the string variable A\$; line 40 branches to line 60 if the keypress was the letter Y; and line 50 ends the program if the keypress was the letter N.

One problem is a design flaw that doesn't have anything to do with character strings per se: The routine doesn't check for any keypresses besides Y or N. If the user types another key by mistake—or on purpose, just to be mischievous—both IF-THEN tests fail and the program drops through to line 60 as if Y were pressed. There are various approaches to this problem, but one quick solution is to insert line 55 GOTO 20 so the question repeats after each invalid response.

The Computer Is Blind

The main problem we're concerned about, however, has to do with the way computers interpret alphabetic

characters. Lines 40 and 50 check for Y or N. But what happens if the user presses a *lowercase* y or n? This can easily happen if the CAPS LOCK key or its equivalent isn't pressed when the program runs. Since this routine doesn't check for y or n, both IF-THEN tests fail and the program drops through to line 60 as if Y were pressed—which may not have been the user's intention at all. Or, if you inserted line 55, the routine keeps pestering the user for a response even though he's frantically pressing what seems to be the right key.

Now, practically anybody who has satisfactorily completed first grade can tell a big Y from a small y or a big N from a small n. But since a computer can't actually see these characters, it can't tell them apart by sight. Instead, it tells characters apart by assigning each one a unique number. Therefore, to a computer, the characters Y and y are as different as A and Z.

To see this for yourself, type PRINT ASC("Y") and press RETURN. The computer should print the number 89 on the screen. This is the ASCII value for the uppercase Y character. ASCII stands for American Standard Code for Information Interchange. It's a code developed in the days of teletype terminals which assigns a unique number to each character; the uppercase alphabet from A-Z is numbered 65-90. The ASC() function in BASIC lets you determine any character's ASCII value.

Now type PRINT ASC("y") and press RETURN. Since the lowercase ASCII alphabet is numbered 96-122, the ASCII value of y is 121 on nearly all computers. Exceptions are the Apple II+ and most Commodore computers (save for the Amiga). You can't type this statement on the Apple II+ because it lacks lowercase characters. And on

the Commodore computers, you can't type lowercase characters without switching to the alternate character set (press SHIFT-Commodore key). In the standard character set, the ASCII value of uppercase Y is 89, as usual; but when you switch to the alternate set, the ASCII value of the *lowercase* y is 89, and the ASCII value of the *uppercase* Y becomes 217.

Despite these exceptions, you can see the point: Computers handle everything in terms of numbers, so you have to take this into account when writing programs. One way to fix the branching routine above is to substitute these lines:

```
40 IF A$="Y" OR A$="y" THEN
   GOTO 60
50 IF A$="N" OR A$="n" THEN END
```

Censored Characters?

There's another function in BASIC which is the opposite of ASC()—it takes a number and tells you the corresponding ASCII character. Try entering the statement PRINT CHR\$(89). The result is the uppercase Y.

Interestingly, some ASCII values represent characters which we can't print here—not because they're obscene and COMPUTE! is a family magazine, but because these "characters" perform a function rather than displaying a letter, number, or symbol. For instance, PRINT CHR\$(125) clears the screen on an Atari 400, 800, XL, or XE. PRINT CHR\$(147) does the same thing on a Commodore 64, 128, VIC, or PET/CBM. PRINT CHR\$(7) rings the internal bell on a Commodore 128 or PET/CBM, Apple, IBM, or Atari ST.

To discover other things you can do by printing these unprintable characters, look for a table of ASCII values in the back of your computer manual or almost any book on BASIC programming. ©



Programming the TI

C. Regena

Computerized Messages

With the abundance of home computers, people are having fun with computerized messages and electronic communication. For instance, you can program your TI to play "Happy Birthday" to a friend. My December columns for the last few years have contained programs for the TI that can be used for Christmas greetings.

The recent birth of our baby was another occasion for computerized messages. My spouse put a system message on the mainframe computer at work so fellow employees would know our news. Electronic mail carried the message to other colleagues. Some of our relatives and friends have TI computers, so I wrote a birth-announcement program and sent them copies. We mailed printed announcements, complete with graphics, to other friends who don't have computers. We're such proud parents that I decided to include the program here. You can use this general idea to create your own computerized messages.

The music for this program is Brahm's "Lullaby." Line 140 defines a tempo in the variable T. The value of T represents an eighth note, and all the CALL SOUND statements express duration in terms of T. Lines 120 and 130 define sound frequencies for the melody notes. Notice that the DATA statement has eight numbers which correspond to the eight variable names in the READ statements. By the way, these frequencies actually represent the flats for each named note except F.

Line 150 changes the screen color. I had planned to use color 8 (cyan) or 5 (dark blue) for a baby boy, or color 7 (dark red) for a baby girl.

Lines 160-600 combine CALL SOUND statements with CALL CHAR statements to define graphic

characters while playing music. Lines 610-650 define the colors for the graphics. Line 620 defines a light-blue color for the stork's hat and part of the baby (try color 10 for a baby girl). Lines 630-650 define the colors for the stork. If you prefer white lettering instead of black, you could change line 630 to FOR N=2 TO 11.

Lines 660-1000 play music while printing the announcement. It displays the graphics on the screen with PRINT instead of CALL HCHAR or CALL VCHAR because the PRINT method is quicker. The CHR\$ statement specifies a certain character number to be printed. Most of the stork is composed of characters that are redefined lowercase letters. Release the ALPHA LOCK key to type these letters in the statements.

Lines 1010-1420 continue playing the music. Lines 1430-1450 keep the announcement on the screen until a key is pressed. A keypress clears the screen and ends the program.

If you prefer to save typing, you can obtain a copy of "Announcement" by sending a blank cassette or disk, a stamped, self-addressed mailer, and \$3 to:

C. Regena
P.O. Box 1502
Cedar City, UT 84720

```

100 REM ANNOUNCEMENT
110 CALL CLEAR
120 READ BG,BA,BB,C,D,E,F,G
130 DATA 185,208,233,247,277,311,349,370
140 T=350
150 CALL SCREEN(8)
160 CALL SOUND(T,88,5)
170 CALL CHAR(123,"0000000000003C7CFE")
180 CALL CHAR(97,"00070C080810101")
190 CALL SOUND(T,BB,6)
200 CALL CHAR(98,"FC0201")
210 CALL CHAR(99,"00000008

```

```

08040404")
220 CALL SOUND(2*T,D,4)
230 CALL CHAR(100,"000E11107088B484")
240 CALL CHAR(101,"0030578989898909")
250 CALL CHAR(102,"0808080808040404")
260 CALL CHAR(103,"040E0E00312E222")
270 CALL SOUND(2*T,D,4,139,8)
280 CALL CHAR(104,"4040B000010101")
290 CALL CHAR(105,"8281407C8380403F")
300 CALL CHAR(106,"5152D4A89063FC38")
310 CALL CHAR(107,"E020204080000F3")
320 CALL SOUND(T,BB,5,139,8)
330 CALL CHAR(108,"040404020202FC04")
340 CALL CHAR(109,"1111100808040404")
350 CALL SOUND(T,BB,4,139,8)
360 CALL CHAR(110,"2020A09050502828")
370 CALL CHAR(111,"37283428282A231")
380 CALL SOUND(2*T,D,4)
390 CALL CHAR(112,"C00000B07F000008")
400 CALL CHAR(113,"04040400CF40808C")
410 CALL CHAR(114,"0404040404040404")
420 CALL CHAR(115,"140C0C1212211101")
430 CALL SOUND(2*T,139,8,185,8)
440 CALL CHAR(116,"101008040201")
450 CALL CHAR(117,"7F0000000000C03F")
460 CALL CHAR(118,"C0000000000000FF")
470 CALL CHAR(119,"0009111222C20201")
480 CALL SOUND(T,BB,5)
490 CALL CHAR(120,"80000000000000FF")
500 CALL CHAR(121,"84444830202020C")
510 CALL SOUND(T,D,4)
520 CALL CHAR(122,"0000000000003844")
530 CALL CHAR(128,"01020408103F")
540 CALL SOUND(2*T,6,3,D,7,BB,9)
550 CALL CHAR(129,"80808087F982808")
560 CALL CHAR(130,"000000C0804")

```

```

570 CALL CHAR(131,"808080
808080808")
580 CALL SOUND(3*T,F,2,D,
8,BB,8)
590 CALL CHAR(132,"000003
")
600 CALL CHAR(133,"808060
808")
610 CALL COLOR(13,11,1)
620 CALL COLOR(12,6,1)
630 FOR N=9 TO 11
640 CALL COLOR(N,16,1)
650 NEXT N
660 CALL SOUND(T,E,2,BB,7
,BG,9)
670 PRINT TAB(5);CHR$(123
)
680 CALL SOUND(2*T,E,3,BA
,7,17,9)
690 PRINT TAB(4);"abcCHAN
DLER AND"
700 PRINT "de fghCHERYL R
EFNA WHITELAW"
710 PRINT "ijklmn"
720 CALL SOUND(2*T,D,4,BA
,7,175,9)
730 PRINT "opqrszANNOUNC
E THE BIRTH OF"
740 PRINT "tuvwxyz"
750 PRINT TAB(3);CHR$(128
);CHR$(129);CHR$(130)
760 CALL SOUND(T,BA,4)
770 PRINT TAB(4);CHR$(131
);" {4 SPACES}BRETT LY
NN WHITELAW"
780 CALL SOUND(T,BB,4)
790 PRINT TAB(3);CHR$(132
);CHR$(133)
800 CALL SOUND(T,C,3)
810 PRINT :
820 CALL SOUND(T,C,3,BG,8
)
830 CALL SOUND(2*T,BA,3,1
39,8)
840 PRINT "BORN: OCTOBER
19, 1985"
850 PRINT "TIME: 2:48 A
.M."
860 CALL SOUND(T,BA,2)
870 PRINT "WEIGHT: 8 PO
UNDS 10 OUNCES"
880 CALL SOUND(T,BB,2)
890 PRINT "LENGTH: 22 I
NCHES"
900 CALL SOUND(T,C,2)
910 CALL SOUND(T,C,2,BG,8
)
920 CALL SOUND(T,139,8)
930 CALL SOUND(T,175,8)
940 CALL SOUND(T,BA,3)
950 CALL SOUND(T,C,2)
960 CALL SOUND(T,F,1)
970 CALL SOUND(T,E,1,BG,6
)
980 CALL SOUND(2*T,D,2,17
5,7)
990 PRINT : "ALSO WELCOM
ED BY CHERY."
1000 PRINT "RICHARD, CIND
Y, BOB, RANDY"
1010 CALL SOUND(2*T,F,2,C
,6,BA,8)
1020 CALL SOUND(T,B,2,BB,
5)
1030 CALL SOUND(T,G,2,BB,
5,BG,8)
1040 CALL SOUND(T,G,2,BB,
5,139,7)
1050 CALL SOUND(T,G,2,BB,
5)
1060 CALL SOUND(T,BG,4)
1070 CALL SOUND(T,BG,3)
1080 CALL SOUND(2*T,G,2,E
,5)
1090 CALL SOUND(2*T,G,2,E
,5,BG,8)
1100 CALL SOUND(T,E,3,BG,
8)
1110 CALL SOUND(T,C,4,BG,
8)
1120 CALL SOUND(4*T,D,3,B
B,6;BG,8)
1130 CALL SOUND(T,BB,4,13
9,8)
1140 CALL SOUND(T,BG,4,13
9,8)
1150 CALL SOUND(T,C,3,BA,
6)
1160 CALL SOUND(T,C,3,BA,
6,139,7)
1170 CALL SOUND(T,D,2,BB,
5)
1180 CALL SOUND(T,D,2,BB,
5,139,9)
1190 CALL SOUND(T,E,1,C,4
)
1200 CALL SOUND(T,E,1,C,4
,139,9)
1210 CALL SOUND(T,BB,1)
1220 CALL SOUND(T,D,2)
1230 CALL SOUND(T,D,2,BG,
8)
1240 CALL SOUND(T,D,2,139
,8)
1250 CALL SOUND(T,BG,4)
1260 CALL SOUND(T,BG,3)
1270 CALL SOUND(2*T,G,1,E
,4)
1280 CALL SOUND(2*T,G,1,E
,4,BG,8)
1290 CALL SOUND(T,E,2,BG,
6)
1300 CALL SOUND(T,C,3,BG,
6)
1310 CALL SOUND(4*T,D,4,B
B,8,BG,9)
1320 CALL SOUND(T,BB,4,13
9,8)
1330 CALL SOUND(T,BG,3,13
9,8)
1340 CALL SOUND(T,C,3,BA,
7)
1350 CALL SOUND(T,C,3,139
,8)
1360 CALL SOUND(50,D,4)
1370 CALL SOUND(50,C,4)
1380 CALL SOUND(T,BB,3)
1390 CALL SOUND(T,E,4)
1400 CALL SOUND(T,BA,5)
1410 CALL SOUND(T,G,5,C,7
)
1420 CALL SOUND(4*T,G,5,B
B,9,BG,12)
1430 CALL KEY(0,K,S)
1440 IF S<1 THEN 1430
1450 CALL CLEAR
1460 END

```

Copies of articles from this publication are now available from the UMI Article Clearinghouse.

For more information about the Clearinghouse, please fill out and mail back the coupon below.

UMI Article Clearinghouse

Yes! I would like to know more about UMI Article Clearinghouse. I am interested in electronic ordering through the following system(s):

- DIALOG/Dialorder ITT Dialcom
 OnTyme OCLC ILL Subsystem

- Other (please specify) _____
 I am interested in sending my order by mail.
 Please send me your current catalog and user instructions for the system(s) I checked above.

Name _____
Title _____
Institution/Company _____
Department _____
Address _____
City _____ State _____ Zip _____
Phone (____) _____

Mail to: University Microfilms International
300 North Zeeb Road, Box 91 Ann Arbor, MI 48106

COMPUTE!
TOLL FREE
Subscription
Order Line
1-800-247-5470
In IA 1-800-532-1272

Memo Diary

You may have noticed that the year value behaves strangely in this program from the December 1985 issue (p. 65). To solve this, add the following two lines, which were accidentally omitted from Program 1 (Atari and TI owners should add line 1030 *only*):

```
1030 IF DMS <= DMS THEN 1050
1040 Y$="/" + RIGHT$(STR$(100 + Y), 2)
```

The article failed to mention that you should enter only two digits for the year when you first run the program (for example, 86 for 1986). Entering all four digits results in incorrect days of the week for the dates you select.

The Atari and TI versions (Programs 3 and 6) each have additional corrections. In both versions, the month can only be entered as a number, not as a word. Also, in the TI version, incorrect menu choices crash the program. Make the following changes, suggested by reader David Wentzel:

Atari version:

```
1695 IF LEN(MMS) > 2 THEN 1710
1770 IF MMS <> MS(0-1) * 3 + 1. J * 3)
THEN 1790
```

TI version:

```
815 IF (A<1) + (A>5) THEN 730
1695 IF LEN(MMS) > 2 THEN 1710
```

Balloon Crazy For TI And IBM

The IBM version (Program 4, p. 59) of this game from the December 1985 issue has a minor bug. When a new screen is drawn after clearing all balloons from a previous screen, the display always shows three clowns remaining regardless of how many are actually left. To correct this, reader Matthew Pomeroy suggests the following change to line 190:

```
190 FOR I=158 TO 158 + (LIVES - 2) *
8 STEP 8: PUT(L,0), TINY: NEXT:
GOSUB 350
```

Part of line 390 is missing in the TI version of this game (Program 5, p. 60). The line should read as follows:

```
390 CALL SPRITE(#3,124,14
,118,MCOL):: GOSUB 56
0 :: CALL DELSPRITE(#
3):: CALL SPRITE(#1,1
36,14,150,MCOL)
```

Apple ProDOS Disk Menu

This utility program from the December 1985 issue (p. 108) gives a BAD SUBSCRIPT ERROR in line 20 when run because its first line is missing. Add the following:

```
5 DIM A$(24), L$(52)
```

Also, David Mariotti suggests the following improvements which cause the selector bar to skip blank lines when there are fewer than 16 items in the directory display:

```
4115 IF CR > LIM + 2 THEN CR = 3
4210 IF CR = 4 THEN CR = LIM + 4
```

Atari Reset Controller

Errors were accidentally introduced in Program 2 for this article from the January 1986 issue (p. 110) when REM statements were deleted. The GOTO 340 in line 300 should be changed to GOTO 360, and the GOTO 180 in line 320 should be changed to GOTO 200. A good programming rule to help avoid such problems is never GOTO a REM statement.

Apple ML Addresses

In the December 1985 "Reader's Feedback" column, there is an error in line 20 of the ProDOS routine for finding the starting address of machine language programs (p. 18). The statement GOTO 15 should be GOTO 20.

Atari Lightning Renumber

The author of this program from the October 1985 issue (p. 103) has provided a fix for a bug that causes the program to sometimes miss internal line number references in

program lines. Line 810 should be changed to read as follows:

```
810 DATA 200,177,203,201,22,240,10,
201,155,240
```

Skyscape

In addition to the small correction published in last month's "Capute!" column, there are a number of corrections required for the Atari version, and additional changes to the Commodore 64, Apple, and TI versions. In the Atari version, the following lines need to be corrected as shown:

```
FN 520 FOR ZZ=1 TO 40:PRINT
CHR$(RF+32)::NEXT ZZ:
GOTO 540
E( 1000 IF ABS(LL)>90 THEN P
RINT 00::GOTO 980
NR 1730 IF P(X,6)<K1 AND P(X
,6)>MS THEN 1760
IF 2590 IF ABS(LL)>90 THEN P
RINT 00::GOTO 2580
CE 2600 GOSUB 2260:IF Z$="N"
THEN 2560
NR 2610 GOSUB 2510:G$="S":GO
TO 1950
```

In the Commodore 64 version, the reinput option of the latitude change feature does not work correctly. Change the THEN 2480 at the end of line 2570 to THEN 2530.

In the Apple version, the day of the week is incorrect after the date is first entered. To correct this, add GOSUB 1670 between the HTAB 5 and the GOSUB 1295 in line 800.

In the TI-99/4A version, the reinput option of the change latitude feature does not work correctly. Change the THEN 2410 at the end of line 2490 to THEN 2460. Also, the DOWN-S in the string in line 500 should read DOWN-N. The TI version states that Extended BASIC is required, but does not mention that expansion memory is also required. TI readers who are interested in modifications necessary to use the program without memory expansion should write to COMPUTE! for details. ©

Classified

SOFTWARE

TI-99/4A NEW STATES AND CAPITALS GAME

Hi-Res map of USA. Send \$12 for cass.
Or \$1 for more info. to: TRINITY SYSTEMS
1022 Grandview, Pittsburgh, PA 15237

TI-99/4A QUALITY SOFTWARE for Business,
Home and Entertainment ** BONUS Software
Offer! ** Send for FREE Catalog to MICRO-BIZ
HAWAII, Box 1108 Pearl City, HI 96762

TI-99/4A Software/Hardware bargains.
Hard-to-find items. Huge selection.
Fast service. Free catalog. D.E.C.,
Box 690, Hickeville, NY 11801

FANTASTIC DAILY NUMBER FORECASTER!

Guaranteed Winners or Money Back!
Picks up to 3 STRAIGHT WINNERS most
every week, playing 1 to 3 a day!
Apple, IBM, C64, Atari, 1 drive. Many
reports of hitting for THOUSAND\$. Send
SASE for info. \$99.95 on disk only to:
Z-Way, P.O. Box 9017, Canton, OH 44711

PROGRAMS FOR THE TANDY 1000
Send \$1 for list of educat. & entertainment
programs. Refundable with first purchase.
SODA POP SW, POB 653, Kenosha, WI 53141

FREE APPLE SOFTWARE

Over 1,000 Public Domain Programs on 50
diskettes, \$5 each, plus \$1 shipping per order.
Send \$1 for catalog, refundable.
C & H ENTERPRISES
Box 29243, Memphis, TN 38127

TI-99/4A DISK OWNERS: Great new software
for home and business - SCHEDULE MANAGER
(\$19.95), DISK DATA BASE (\$15.00) TUNNELS
OF DOOM GAME EDITOR (\$20.00), etc. Send
orders to ASGARD SOFTWARE, P.O.B. 10306,
ROCKVILLE, MD 20850. Catalog on request.

LOTTO PICKER. Improve your chances for those
Million Dollar Jackpots! Picks LOTTO, WIN-4, &
Daily Numbers. All USA & Can. games incl.
Expandable! IBM/C64/TI99 \$29.95. Order Now!
1-800-341-1950 Ext. 77. Mail Orders: Ridge, 170
Broadway, #201-C, NYC, NY 10038. Catalog.

SAVE MONEY! EASY TAX SIMPLIFIES THE 15
most common IRS tax forms. Faster, line
by line preparation on screen/printer.
Commodore 64, disk. Send \$39.95 plus \$2.00
s.h. to Hybrid Software, 1739 Schilder Lane,
Waverly, OH 45690

PROJECT PLANNING/MANAGEMENT using
the C64, SX, or C128 Data sheet for SASE -
Prgm for \$106.95 (CA res. add 6% s/s tx).
LAWCO, Dept. C, Box 2009, Manteca, CA 95336

**Genealogy Program for the C64. "FAMILY
TREE"** will produce Pedigree Charts, Family
Group Records, Individual Files, Indexes, Searches
of Ancestors. LDS version available. "The Best"
genealogy program for the 64. \$49.95,
GENEALOGY SOFTWARE, POB 1151, PORT
HURON, MI 48061, (519) 344-3990.

Animal Records maintained with "PETIGREE"
for the C64. Produces Litter, Awards, Breeding
Show, Individual Records, Pedigree Charts.
\$69.95. GENEALOGY SOFTWARE, POB 1151,
PORT HURON, MI 48061, (519) 344-3990.

FREE SOFTWARE CATALOG!

Call Toll-Free 1-800-554-1162, Tevex, Inc.
Save 1/3 off retail prices. We carry SSI,
Elect. Arts, Infocom, and many more!

CHEMISTRY TUTORIAL - Science software

programs idea for teaching and review
of the basics of chemistry. The chemical
and physical properties of 106 known
elements. This program has a complete
and unique presentation of the **PERIODIC
TABLE**. Supplied on dual-sided disk
(C64 and Apple IIe versions) . . . \$29.95.
**SPRINGHILL LABORATORY COMPUTER SOFT-
WARE**, P.O. Box 155, Clarksville, Ohio 45113

COMMODORE: TRY BEFORE YOU BUY. Top 25
best-selling games, utilities, new releases. Visa,
MasterCard. Free brochure. Rent-A-Disk, 908 9th
Ave., Huntington, WV 25701 (304) 522-1665

ATARIWARE: The BEST PD software from Atari
Enthusiasts across the U.S.! 80 disks to
choose from \$5 each. Catalog with SASE.
KD-ACE, 1187 Dunbar Ct., Orange Pk, FL 32073

INTEREST CALCULATIONS.

MAI-2.10 lets your computer help analyze
investment decisions. Calc: future value, present
value, annuities, sinking funds, loan pymt
sched., + more! Menu driven/Simple. IBM
PC/XT/jr or compat. Only \$49.95 + \$7 s/h/t.
ck/mo. Munier Associates, Inc., Dept. A5,
P.O. Box 79314, Houston, Texas 77279
(713) 784-4348.

HARDWARE

Hey! Monitor Cables \$5.95. Joystick ext. 6'-
\$3.95, 12'-\$4.95. p/h incl. Comdr Disk + Print
Cables Custom \$3 + .75/ft. + p/h. JCRL, 5043
E. Mitchell, Phoenix, AZ 85018 (602) 990-4643

BUY/SELL USED MICRO EQUIPMENT
Quickly, easily. National Listing Service.
No Commission. TECTRAN, 1-800-832-8726
(orders) 1-617-491-4888 (info.)

HARDWARE & SOFTWARE 30% BELOW
RETAIL. Apple, Atari, C64, IBM-PC, TI-99. Over
1000 titles. Hard to find items. Atari 520 ST
Computer/Color-\$829.00. Send \$1.00 for
catalog. Specify computer. Multi-Video,
P.O. Box 246, East Amherst, NY 14051.

MISCELLANEOUS

REBIBONS for ANY PRINTER at LOW PRICES!!
DELTA MICRONICS
BOX 10933, ERIE, PA 16514
(814) 455-5667

HELP IS ON THE WAY!

Just call 1-800-334-0868 to get your free
copy of the latest COMPUTE! Books Catalog!
If you need help in getting information on
all of the latest COMPUTE! book titles
available plus all COMPUTE! backlist titles,
call us today!

C64 USERS - FREE BROCHURE! Game and
instructional programs, each include detailed
analysis, beg. or int. level. SASE to:
C16 H.O.S., 19730 Ave 18, Madera, CA 93637

FREE CATALOG. Specify TI99, Commodore,
IBM. Hardware, Software, Accessories.
Competition Computer, 2629 W. National,
Milwaukee, WI 53204 (800) 662-9253

Maxell MD1, \$1.29-MD2, \$1.99. Dysan 104/1D,
\$1.79-104/2D, \$2.39. Shipping \$3.75. Also
Verbatim, IBM, 3M, BASF. TAPE WORLD, 220
Spring St., Butler, PA 16001, 1-800-245-6000:
Visa. MC.

DISK SALE! - SS/DD 35-trk for Apple w/sleeve
& label-10/\$5.80, bulk-100/\$45. Standard
SS/DD w/sleeve & label-10/\$7.50, bulk-
100/\$59. DS/DD w/sleeve & label-10/\$8.50,
bulk-100/\$67. 3 1/4" SS for Mac-10/\$19.99.
PREMIUM QUALITY, LIFETIME WARRANTY!
Money-back satisfaction guarantee! Min. order
\$20. Send check or pay by MC/VISA/AE \$3
shipping. + \$7 if C O D - IINITECH, 20 Hurley
St., Cambridge, MA 02141. (800) 343-0472, in
Mass. (617) "UNI-TECH".

FREE CATALOG . . . PRINTER PAPER

Discount Prices . . . Quick Delivery
Universal Services, Inc., P.O. Box 484,
Grand Haven, Michigan 49417

EARN MONEY, PART OR FULL TIME, AT
HOME with your computer-manual & forms-
\$9.95. Write Computer Programs for Profit!
How-to guide with forms, letters, tips-\$7.95.
Also-Computer Consultant Handbook. How to
earn \$ consulting with business-\$7.95. JV Tech,
P.O. Box 563, Lindington, MI 49431

SERVICE MANUAL WITH SCHEMATICS FOR
ATARI 800XL-\$19.50; Atari 1050-\$19.50. (805)
927-4667. Visa/MC. Free catalog. Electronic
Dimension. Box 1846, San Luis Obispo, CA 93406

**IBM PCjr REPORT: THE NATIONAL NEWS-
LETTER.** PCjr-specific articles, reviews, Public
Domain from across the nation. \$18./yr. PCJR
CLUB, POB 95067, Schaumburg, IL 60195

Don't take chance of LOSING DATA caused by
HUMIDITY. Disk manufacturers spec. 80% max.
Get 15 reusable drypacks for only \$2 to
protect all your disks permanently.
CHINGHAI, Box 2687, Costa Mesa, CA 92628

COMPUTE! Classified is a low-cost way to tell over 350,000 microcomputer owners about your product or service.

Rates: \$25 per line, minimum of four lines. Any or all of the first line set in capital letters at no charge. Add \$15 per line for boldface words, or \$50 for the entire ad set in boldface (any number of lines)

Terms: Prepayment is required. Check, money order, American Express, Visa, or MasterCard is accepted. Make checks payable to COMPUTE! Publications.

Form: Ads are subject to publisher's approval and must be either typed or legibly printed. One line equals 40 letters and spaces between words. Please underline words to be set in boldface.

General Information: Advertisers using post office box numbers in their ads must supply permanent address and telephone numbers. Orders will not be acknowledged. Ad will appear in next available issue after receipt.

Closing: 10th of the third month preceding cover date (e.g., June issue closes March 10th). Send order and remittance to: Harry Blair, Classified Manager, COMPUTE!, P.O. Box 5406, Greensboro, NC 27403. To place an ad by phone, call Harry Blair at (919) 275-9809.

Notice: COMPUTE! Publications cannot be responsible for offers or claims of advertisers, but will attempt to screen out misleading or questionable copy